# Bagworm

## Carries shelter made of clipped foliage and twigs

**Name and Description—***Thyridopteryx ephemeraeformis* (Haworth) [Lepidoptera: Psychidae]

Male bagworm moths are sooty black with a densely hairy body, clear wings, and a wingspread of about 1 inch (25 mm) (fig. 1). Female adults are soft-bodied and grub-like. They are naked except for a circle of woolly posterior hairs and are yellowish-white in color with no functional legs, eyes, or antennae (fig. 2). Larvae, pupae, and adult females live inside a bag constructed of silk, twigs, and leaves (figs. 3-6). Mature larvae are dark brown and 3/4-1 inch (18-25 mm) long. The head and thoracic plates are yellowish and spotted with black (fig. 5). Bags of mature larvae are 1 1/4-2 inches (3-5 cm) long and vary in appearance due to the use of host material in bag construction (figs. 5-6). Eggs are small, white, and found inside female bags. Bagworm is a native defoliator that occurs throughout the eastern half of the United States, is commonly encountered in Kansas and Nebraska, and has been occasionally reported in South Dakota.

Figure 1. Bagworm adult male. *Photo: Pennsylvania Department of Conservation and Natural Resources, Forestry Archive, Bugwood.org.*

**Hosts—**Bagworm feeds on a wide variety of trees and shrubs but is primarily a pest on arborvitae and eastern redcedar. Other coniferous and broadleaf hosts include juniper, pines, spruces, apple, basswood, box-elder, elms, black locust, maple, oaks, persimmon, poplars, and willows.

Figure 2. Bagworm adult female removed from her bag. *Photo: Lacy L. Hyche, Auburn University, Bugwood.org.*

**Life Cycle—**Bagworm has one generation per year across almost its entire range. In September or October, adult males emerge and begin their mating flight, seeking the wingless females. Females remain within their bag, so mating takes place through the bag opening. The female's bag also contains her empty pupal case, into which eggs are laid. Adults die, and eggs overwinter within their mother's bag that is attached to a twig with silk. Eggs hatch in May or June, yielding 1/25 inch (1 mm) long glossy black or brownish larvae that almost immediately begin to spin their own bag. Young larvae, buoyed by long strands of silk, can be dispersed short distances by wind. The bag begins as a garland of pellets on a long silken strand around the larva's body behind the legs, to which it adds twigs and leaf material, eventually becoming large enough to enclose the entire immature insect (fig. 3). Larvae move about carrying their tough, silken bag with them. An opening is maintained at the top of the bag, through which the head and several segments protrude when the larva is feeding, moving, or enlarging the bag (fig. 5). There is a smaller opening on the bottom of the bag through which excrement is passed. Larvae mature from August through September, firmly anchoring their bag prior to pupation (fig. 6). Despite having wingless females, bagworms are widely distributed due to wind-aided larval dispersal, unintended movement by humans, an ability to go long periods without food, a wide host range, and the production of many eggs by a single female.

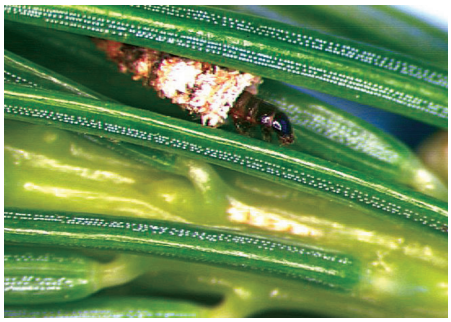

Figure 3. Young bagworm larva with bag on Colorado blue spruce. *Photo: Rayanne Lehman, Pennsylvania Department of Agriculture, Bugwood.org.*

**Damage—**Bagworm is seldom a forest pest of economic concern, but it is commonly a problem on trees and shrubs in urban settings, parks, and shelterbelts. Arborvitae and juniper can be killed by complete defoliation.

Less severe defoliation results in reduced growth and weakens host plants, increasing susceptibility to opportunistic damaging agents. Mortality and gouting of twigs has been attributed to the girdling effect of the tight silken bands with which larvae attach the bags (fig. 6). Periodically, bagworm becomes exceedingly abundant, defoliating most any plant it can contact. Although young larvae are inconspicuous and have little impact, the seemingly sudden defoliation of tree tops and presence of unsightly, though highly visible, bags of large larvae firmly attached to twigs and leaves causes considerable consternation. Bags may remain attached and intact long after the insects that constructed them have died.

Figure 4. Mature bagworm larva in its silk-lined bag that was cut open. *Photo: Lacy L. Hyche, Auburn University, Bugwood.org.*

**Management—**Bagworm populations vary widely in size from year to year. Disease, low winter temperatures, bird predation, and, especially, parasitic wasps affect population size and collapse the short-lived epidemics.

Because they are so conspicuous, overwintering bags and the eggs they contain can be picked from small trees and shrubs and then destroyed. Discarding, but not completely destroying removed bags may result in eggs surviving, hatching, and dispersing larvae that reinfest treated trees. Labeled, registered insecticides are available to use as an alternative means of control against small bagworm larvae in spring or early summer. However, by about early July when larvae are more than 1/2 inch (13 mm) long, it is nearly impossible to kill them using insecticide. It is often at this time or later when bagworm infestations and associated defoliation become apparent.

Figure 5. Bagworm larva crawling out of its bag. *Photo: Connecticut Agricultural Experiment Station, Bugwood.org*

Figure 6. Several larval bags that show white, silk anchors around the branch. *Photo: Lacy L. Hyche, Auburn University, Bugwood.org.*


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